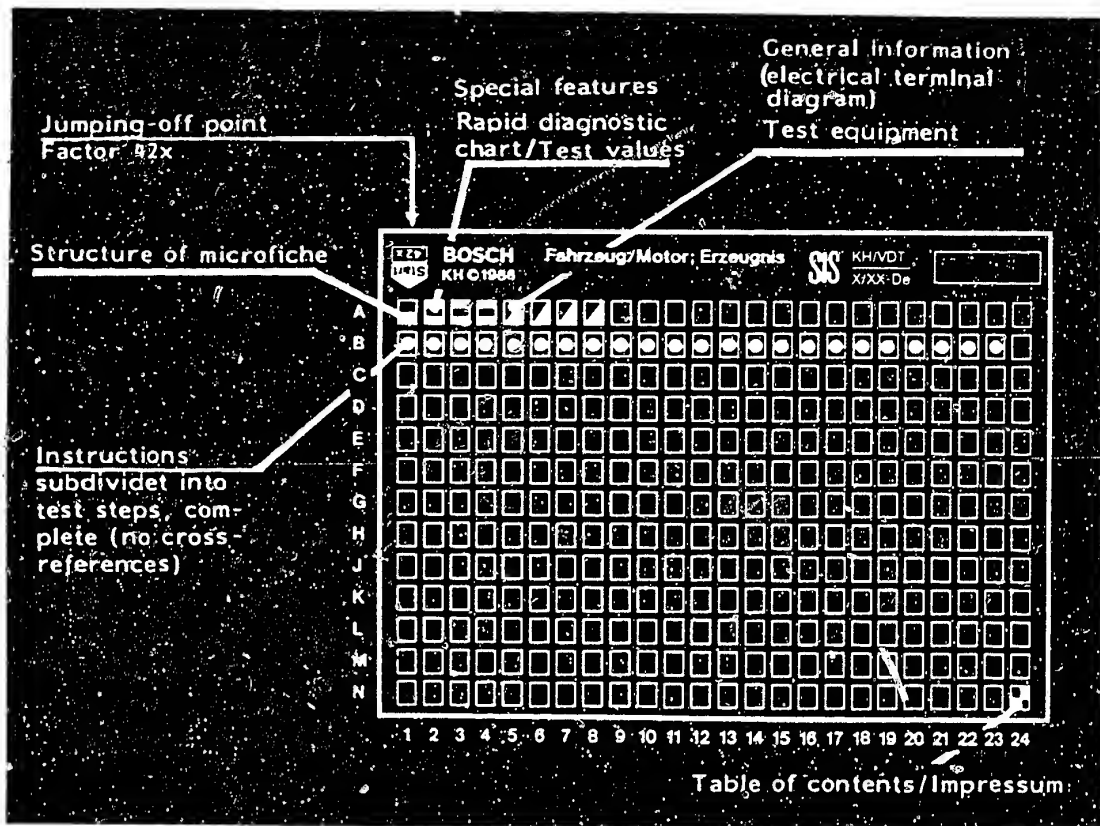


## Structure of microfiche



1. Read from left to right
2. Title of microfiche (appears on each coordinate)

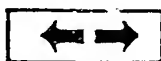
<b>E16</b>	Product/component/test step
	Vehicle/engine

Coordinate

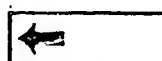
3. Limits of section



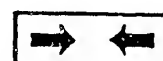
Beginning



Mid-section



End



One-page section

4. References to relevant test steps in test specifications; coordinate e.g. C6

**C6**

**A1**

Repair and testing

## 1. Special features

Microcard for testing and repairing the electrical headlight vertical aim control (LWR) installed as optional equipment since mid 1985 in the Audi 100/200 turbo.

## 2. Rapid diagnosis chart for headlight vertical aim control (LWR)

The following rapid diagnosis chart makes it possible for the experienced specialist to test the LWR system using the headlight aiming device 0 681 130 .. or 0 684 100 .. .

The contents of this list are restricted to the following information:

- Test step sequence
- Setting instructions and test specifications (headlight aiming device reading values)
- Reference to the coordinates of respective detailed testing and trouble-shooting programs.

If detailed information and references are necessary, proceed per testing and adjustment information starting with Coordinate B 1.

### Prerequisites for testing

- Tire pressure correct
- Vehicle ready to drive (full tank) and unloaded except for 75 kg (driver) (per EEC guideline 76/756)
- Lower beams on
- Headlight aiming device set up per operating instructions.

Testing and adjusting must always be carried out for both headlights.



Rapid diagnosis chart for testing with headlight aiming device 0 681 130 ... or 0 684 100 ...

Always carry out testing with both headlights!

Test step	Set thumbwheel in vehicle to:	Set headlight aiming device to:	Set headlights to:	Reading on headlight aiming device
1	Position "0" (basic setting)	10 cm inclination	Cutoff	--
2	Position "1"	Cutoff	--	between 8.5 cm and 18.5 cm
3	Position "2"	Cutoff	--	between 18.5 cm and 28.5 cm
4	Position "3"	Cutoff	--	between 30 cm and 40 cm
5	Position "0" (basic setting)	10 cm inclination	--	Cutoff

**A3**

Rapid diagnosis chart  
Audi, headlight vertical aim control



**A4**

Rapid diagnosis chart  
Audi, headlight vertical aim control



### 3. General information

The headlight vertical aim control with thumbwheel is located on the left on the dashboard.

Basic setting on the headlights is undertaken in test step 1.

#### Note:

Basic setting is with reference to EEC setting specifications.

Outside West Germany, observe local specifications.

**A5**

General information

Audi, headlight vertical aim control



## Operation

Depending on vehicle loading, using the thumbwheel of the headlight vertical aim control it is possible to infinitely adjust the headlight reflectors between two stops:

Position "0": Basic setting

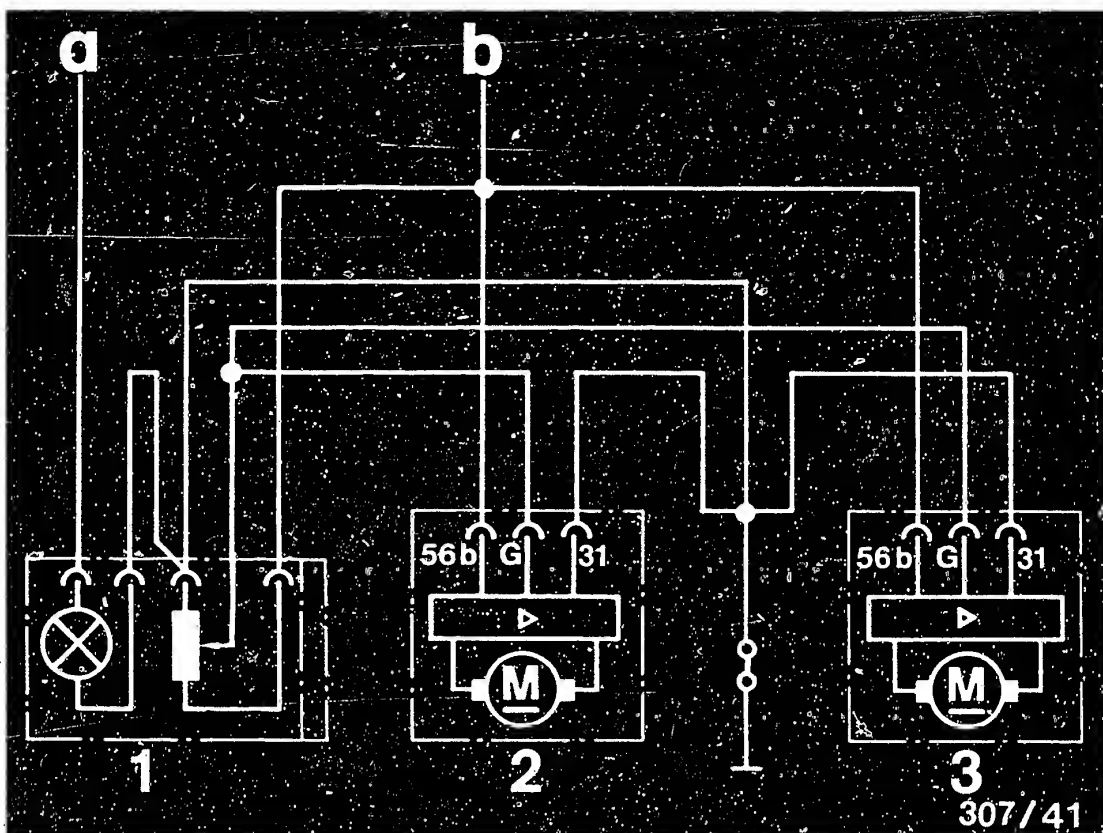
Position "3": Reflectors inclined downwards.

With the headlight vertical aim control thumbwheel, the sensor voltage (nominal voltage) is set. The actuator supplies a voltage dependent on adjustment travel (actual voltage).

The switching electronics in the actuator compare nominal with actual voltage.

Depending on the voltage difference, the reflectors are moved up or down.





1 = Headlight vertical aim controller with thumbwheel

2 = Control motor with actuator, left

3 = Control motor with actuator, right

a = to brightness controller for instrument illumination

b = to fuse term. 56 B and bulb-failure indicator

4. Circuit diagram for the electrical headlight vertical aim control for the Audi 200/200 Turbo

## 5. Test equipment

Headlight aiming device 0 681 130 ...

or

Headlight aiming device 0 684 100 ...

Voltmeter/ohmmeter

e.g. Electric-Tester ETE 014.00 0 684 101 400

or

Multimeter commercially  
available



## 6. Testing and repair

### Prerequisites for testing the LWR system:

- Tire pressure correct
- Vehicle ready to drive (full tank) and unloaded except for 75 kg (driver) (per EEC guideline 76/756)
- Lower beams on
- Headlight aiming device set up per operating instructions
- Battery voltage > 10 V

Testing and adjusting must always be carried out for both headlights

#### Note

For detailed testing and trouble-shooting, carry out the test steps sequentially starting with Coordinate B 1.

Continue with the trouble-shooting given under the test steps only when a fault is found.





## Test step 1:

### Test subject:

Basic headlight setting

### Measuring equipment:

Headlight aiming device

0 681 130 ...

0 684 100 ...

### Headlight aiming device setting:

10 cm inclination

### Operation in vehicle:

Turn thumbwheel (upper illustration) to position "0" (basic setting)

### Test specification (reading):

Cutoff to headlight aiming device (10 cm inclination)

Is cutoff correctly set?

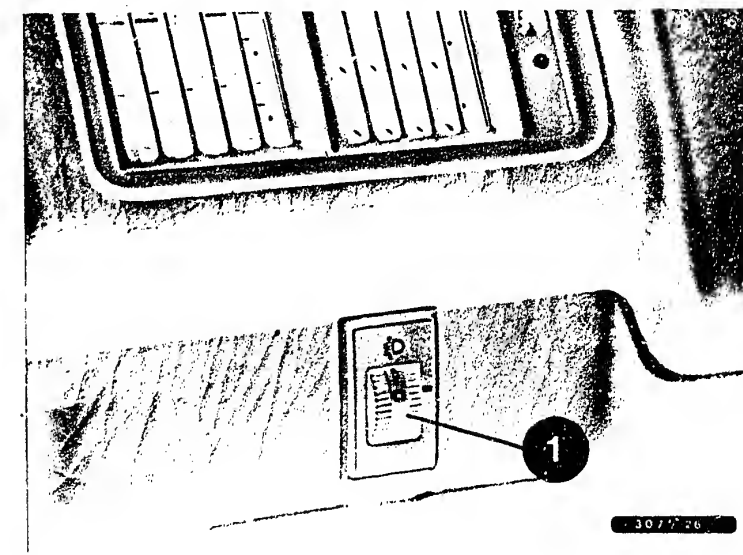
no

### Trouble-shooting:

Correctly adjust headlights to cutoff at adjusting screw (lower illustration).

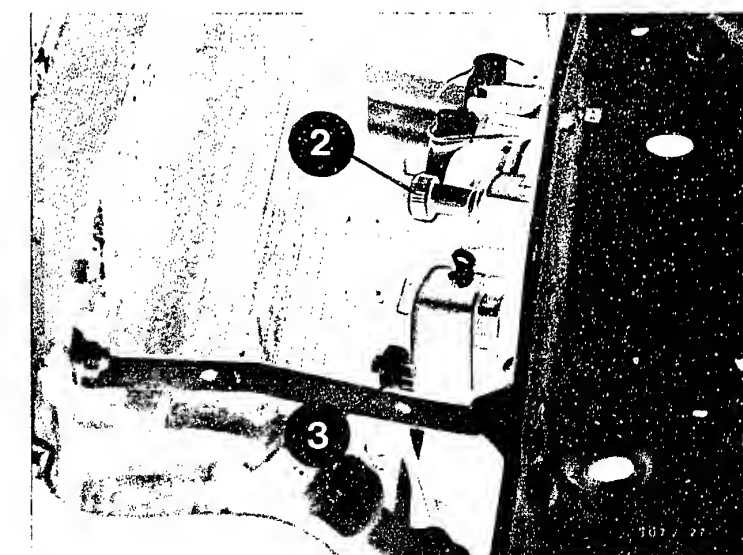
If headlights are not mechanically adjustable:

Check headlights and actuators for damage and replace if necessary.



1 = Headlight vertical aim control with thumbwheel

2,3 = Adjusting screw for basic setting



yes

Continued on next page

**B2**

Testing and repair

Audi, headlight vertical aim control



**B3**

Testing and repair

Audi, headlight vertical aim control



Test step 2:

Test subject:

LWR system, downwards adjustment

Measuring equipment:

Headlight aiming device

0 681 130 .. (upper illustration)

0 684 100 .. (lower illustration)

Operation in vehicle:

Turn thumbwheel to position "1".

Headlight aiming device setting:

Set to cutoff.

Test specifications (reading)

Cutoff lies between 8.5 cm and 18.5 cm inclination. (Read off on headlight aiming device adjustment scale)

Is test specification reached?

yes

Continued on next page

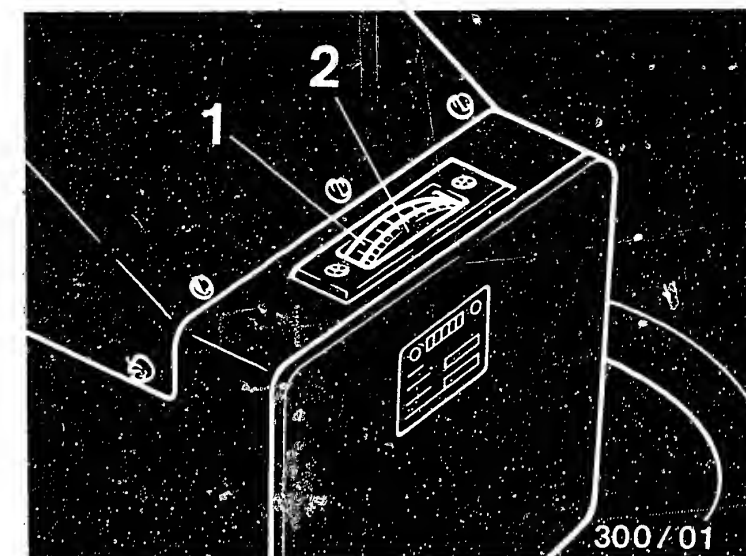
no

Trouble-shooting:

Headlight adjustment only partially reached:

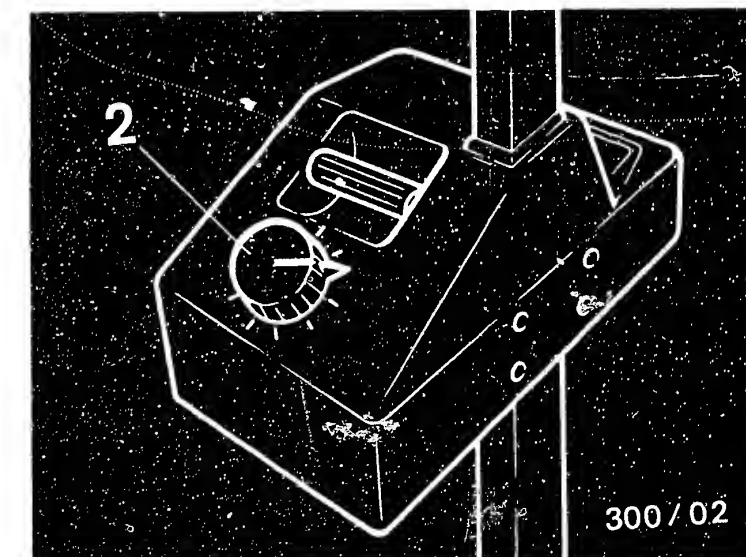
Check headlights for freedom of movement.

Check adjustment travel of actuators.



1 = Adjustment scale

2 = knurled thumbscrew or rotary knob for adjusting inclination



Continued on next page

**B4**

Testing and repair

Audi, headlight vertical aim control



**B5**

Testing and repair

Audi, headlight vertical aim control



Trouble-shooting, when headlight adjustment present only in part or not at all:

1. No voltage at actuator (terminal 56 b or sender lead see upper illustration).

Visual check: cable fallen out or damaged.

2. Open circuit at terminal 31 on actuator.

Visual check: cable fallen out or damaged.

3. Test center voltage at actuators: turn thumbwheels to position "0", sender voltage should be approx.  $U_B$ .

Turn thumbwheel to position "1", sender voltage should be approx. 10 V.

4. Check actuators for ground connection.

5. Open circuit in voltage to headlight vertical aim control:

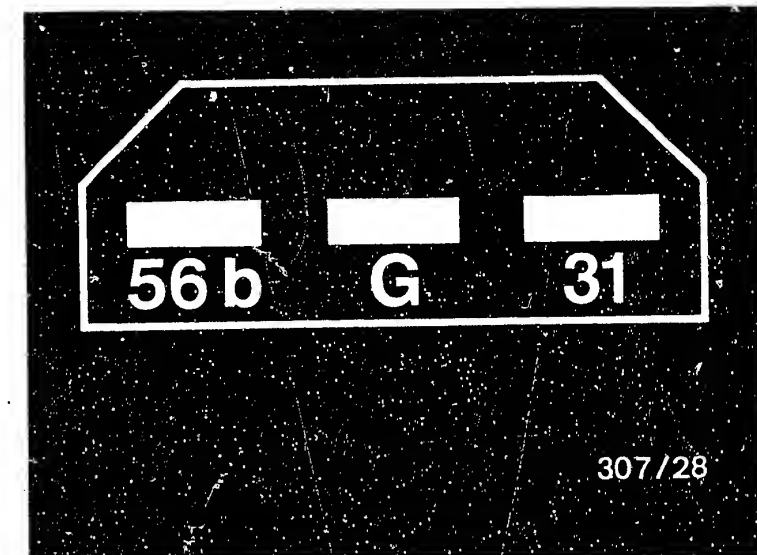
Visual check: cable or plug fallen out (terminal 56b, 31, sender lead)

6. Test sender voltage at headlight vertical aim control:

Set thumbwheel to position "0", sender voltage should be approx.  $U_B$ .

Set thumbwheel to position "1", sender voltage should be approx. 10 V.

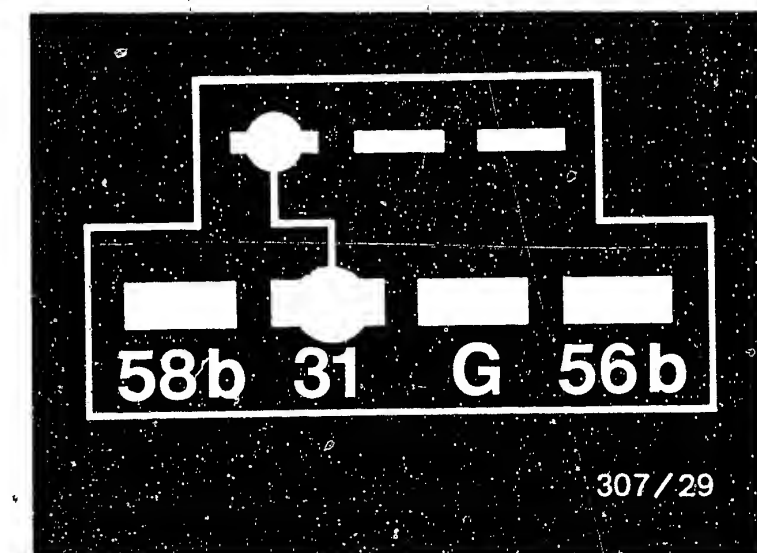
Continued on next page



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Actuator terminal assignment

Headlight vertical aim control terminal assignment



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**B6**

Testing and repair

Audi, headlight vertical aim control



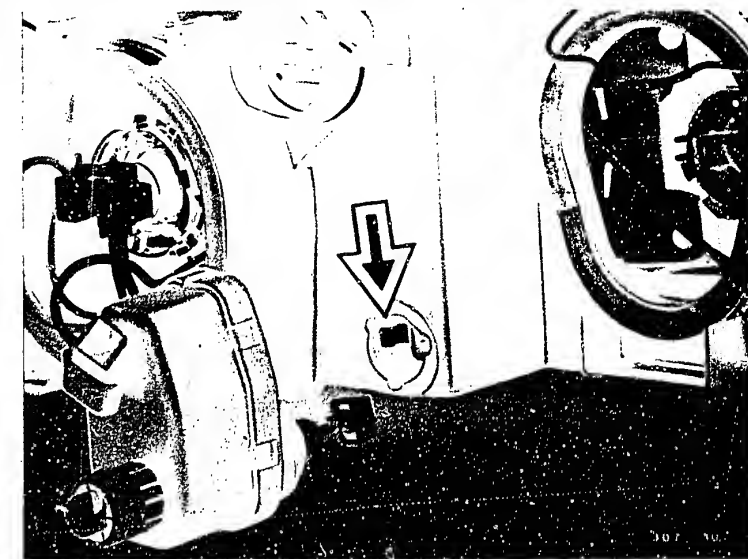
**B7**

Testing and repair

Audi, headlight vertical aim control

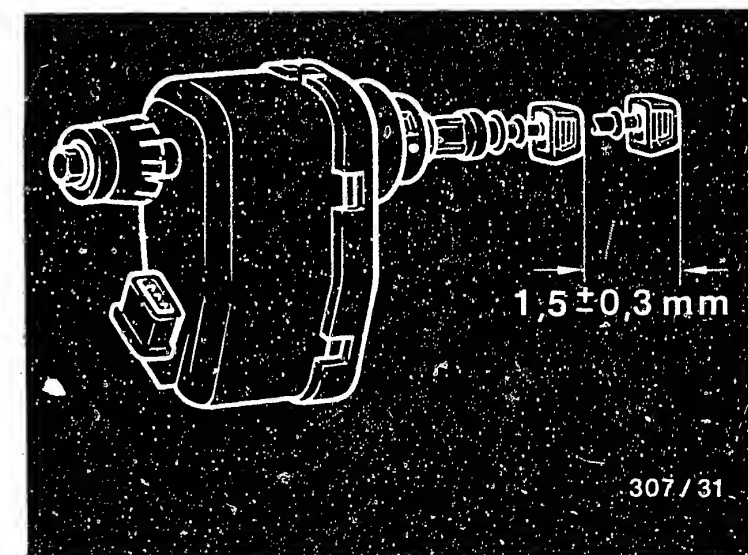


7. Check actuator adjustment travel: to do this, remove actuators. Remove actuator by turning out of its seat (bayonet catch). Lift catch with screwdriver (see upper illustration, arrow) and pull clamping piece out of clamping jaw. Test reflectors for freedom of movement. Set thumbwheel at "0", measure projection of adjustment spindle. Set thumbwheel at position "1", again measure projection of adjustment spindle. If the difference between the measurements is smaller than 1.2 mm, replace actuator.



Arrow = Catch for clamping piece

Continued on next page



**B8**

Testing and repair

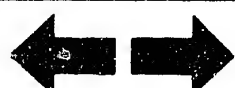
Audi, headlight vertical aim control



**B9**

Testing and repair

Audi, headlight vertical aim control



Test step 3:

Test subject:

LWR system, downwards adjustment

Measuring equipment:

Light aiming device

0 681 130 ..

0 684 100 ..

Operation in vehicle:

Turn thumbwheel (upper illustration) to position "2".

Headlight aiming device setting:

Set to cutoff.

Test specification (reading):

Cutoff lies between 18.5 cm and 28.5 cm inclination (read off at headlight aiming device adjustment scale)

Is test specification reached?

yes

Continued on next page

no

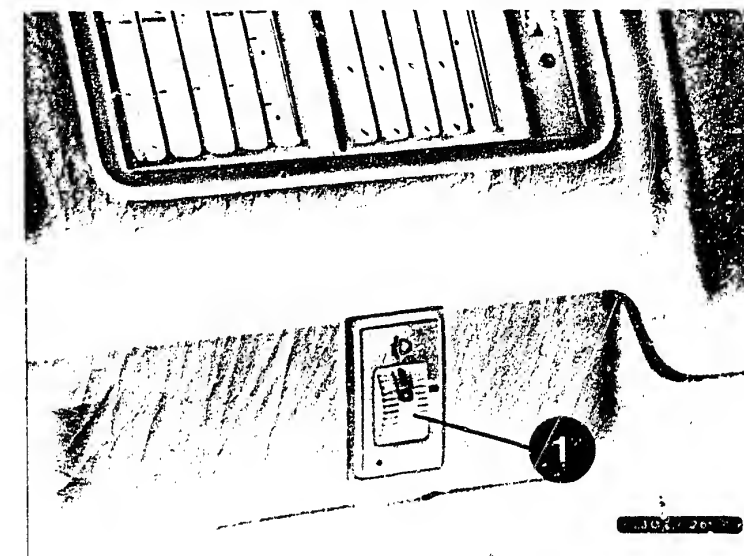
Trouble-shooting:

Headlight adjustment is reached only in part:

Check headlights for freedom of movement.

Check actuator adjustment travel.

Continued on next page



1 = Headlight vertical aim control with thumbwheel

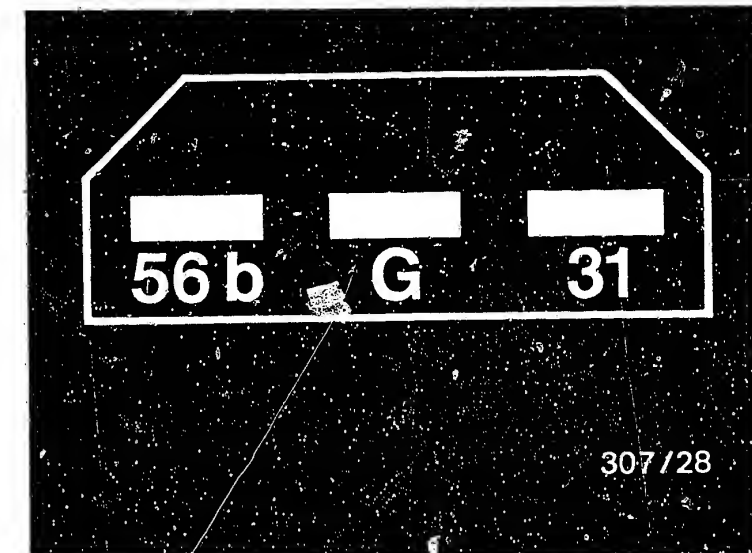


Trouble-shooting, when headlight adjustment present only in part or not at all:

1. No voltage at actuator (terminal 56b or sender lead, see upper illustration).  
Visual check: cable fallen out or damaged.
2. Open circuit at terminal 31 on actuator.  
Visual check: cable fallen out or damaged.
3. Test sender voltage at actuators: set thumbwheel to position "0", sender voltage must be approx.  $U_B$ .  
Set thumbwheel to position "2", sender voltage must be approx. 8 V.
4. Check actuators for ground connection.
5. Open circuit in voltage to headlight vertical aim control:  
Visual check: cable or plug fallen out (terminal 56b, 31, sender lead)
6. Test sender voltage to headlight vertical aim control:  
set thumbwheel to position "0", sender voltage should be approx.  $U_B$ .  
Set thumbwheel to position "2", sender voltage should be approx. 8 V.

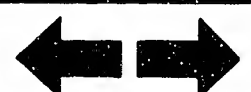
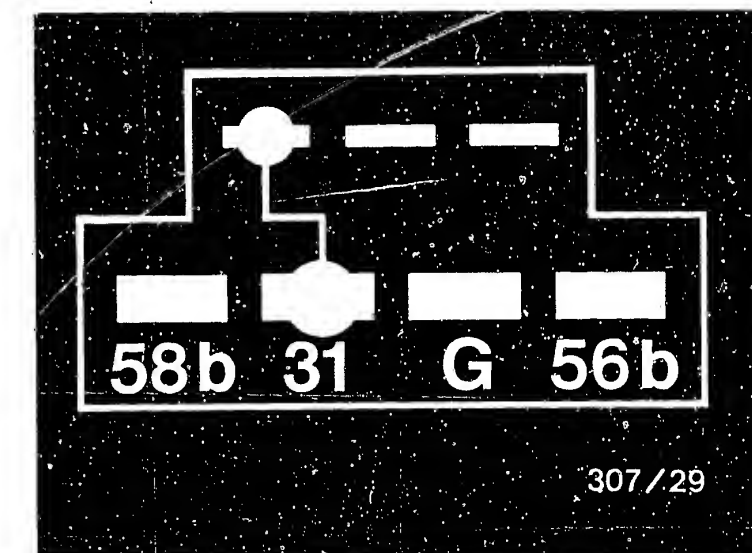
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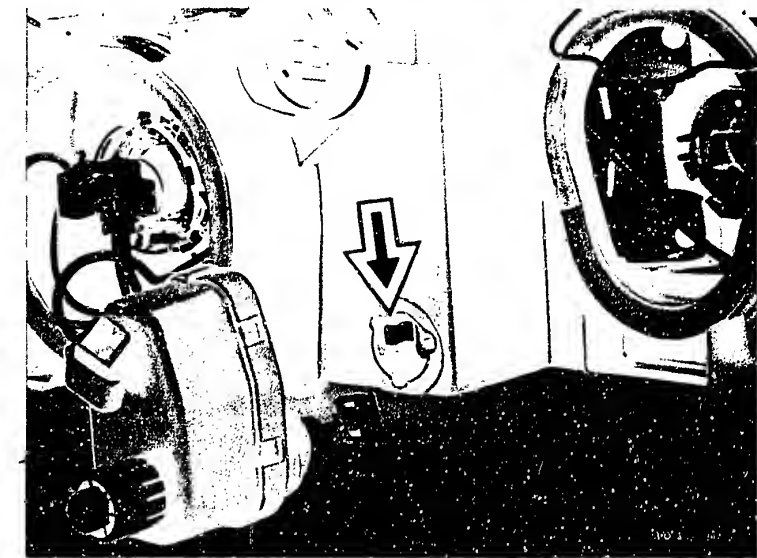
Actuator terminal assignment

Headlight vertical aim control terminal assignment



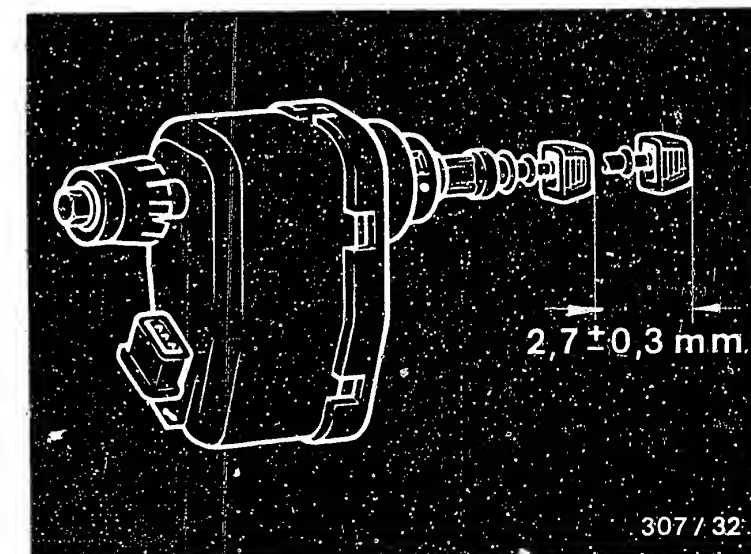


7. Test actuator adjustment travel: to do this, remove actuator. Remove actuator by turning it out of its seat (bayonet catch). Lift catch with screwdriver (see arrow, upper illustration) and pull clamping piece out of clamping jaw. Test reflectors for freedom of movement. Set thumbwheel to position "0", measure projection of adjustment spindle. Set thumbwheel to position "2", again measure projection of adjustment spindle. If the difference between the measurements is smaller than 2.4 mm, replace actuator.



Arrow = Catch for clamping piece

Continued on next page



**B 14**

Testing and repair

Audi, headlight vertical aim control



**B 15**

Testing and repair

Audi, headlight vertical aim control



Test step 4:

Test subject:

LWR system downward adjustment

Measuring equipment:

Headlight aiming device

0 681 130 ..

0 684 100 ..

Operation in vehicle:

Turn thumbwheel (upper illustration)  
to position "3".

Headlight aiming device setting:

Set to cutoff.

Test specification (reading):

Cutoff lies between 30 cm and 40 cm  
inclination. (Read off on headlight  
aiming device adjustment scale).

Is test specification reached?

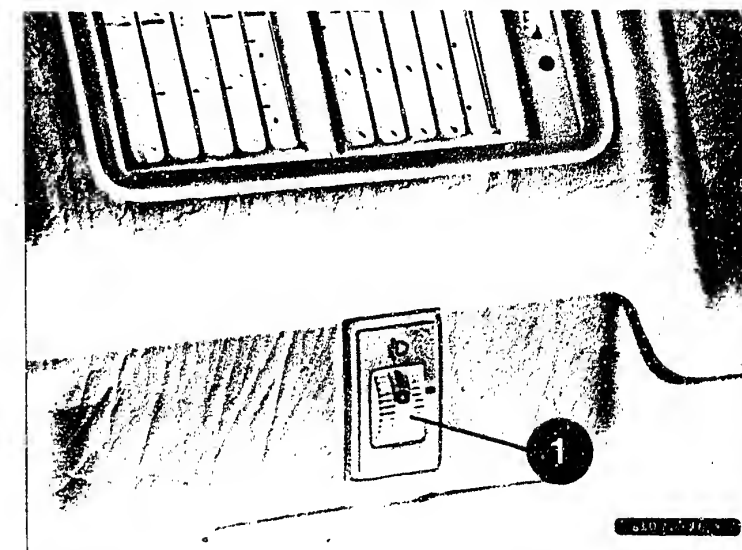
yes

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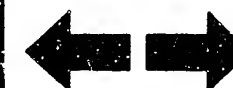
Trouble-shooting:

Headlight adjustment is reached only  
partially:  
Check headlights for freedom of  
movement. Test actuators.

Continued on next page



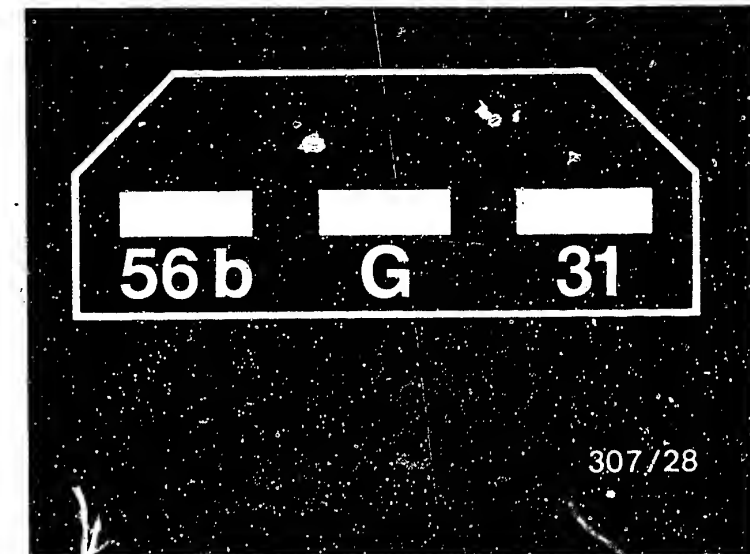
1 = Headlight vertical aim control  
with thumbwheel





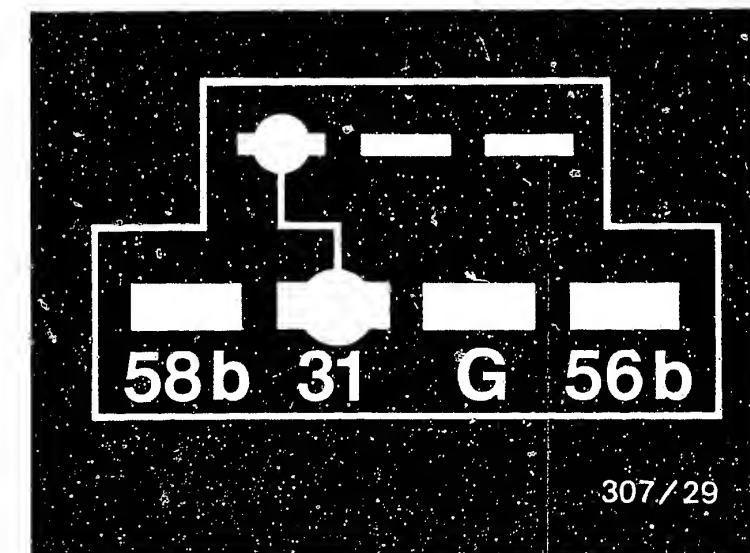
Trouble-shooting when headlight adjustment present only in part or not at all:

1. No voltage at actuator (terminal 56b or sender lead, see upper illustration).  
Visual check: cable fallen out or damaged.
2. Open circuit in terminal 31 at actuator.  
Visual check: cable fallen out or damaged.
3. Test sender voltage at actuators: set thumbwheel to position "0", sender voltage should be approx.  $U_B$ .  
Set thumbwheel to position "3", sender voltage should be approx. 6 V.
4. Check actuators for ground connection.
5. Open circuit in voltage to headlight vertical aim control:  
Visual check: cable or plug fallen out (terminal 56b, 31, sender lead)
6. Test sender voltage to headlight vertical aim control:  
Set thumbwheel to position "0", sender voltage should be approx.  $U_B$ .  
Set thumbwheel to position "3", sender voltage should be approx. 6 V.



Actuator terminal assignment

Headlight vertical aim control terminal assignment



Continued on next page

Continued on next page

**B 18**

Testing and repair

Audi, headlight vertical aim control



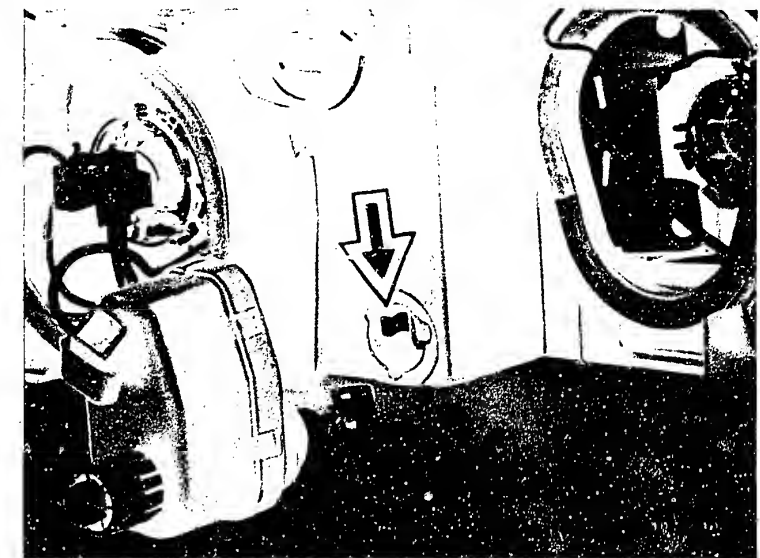
**B 19**

Testing and repair

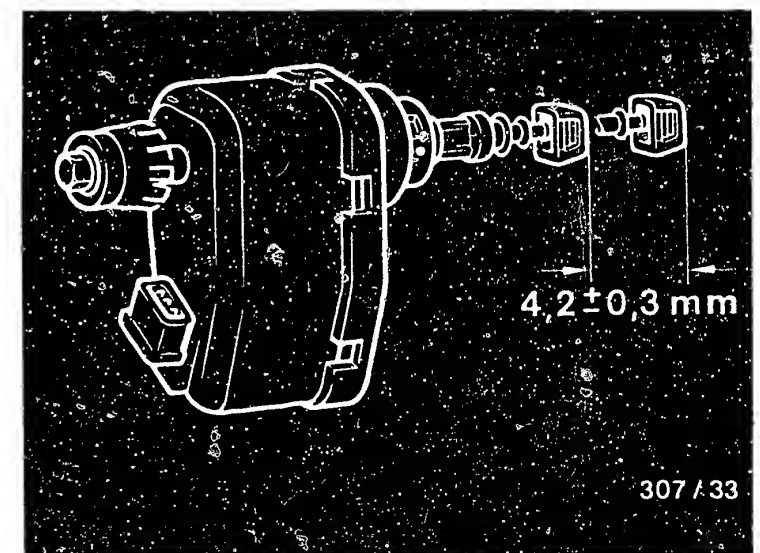
Audi, headlight vertical aim control



7. Test actuator adjustment travel: to do this, remove actuators. Remove actuator from its seat by turning (bayonet catch). Lift catch with screwdriver (see upper illustration) and pull clamping piece out of clamping jaw. Check reflectors for freedom of movement. Set thumbwheel to position "0", measure projection of adjustment spindle. Set thumbwheel to position "3", again measure projection of adjustment spindle. If the difference between the two measurements is smaller than 3.9 mm, replace actuator.



Arrow = Catch for clamping piece



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Continued on next page

**B20**

Testing and repair

Audi, headlight vertical aim control



**B21**

Testing and repair

Audi, headlight vertical aim control



Test step 5:

Test subject:

LWR system, basic setting

Measuring equipment:

Headlight aiming device

0 681 130 ..

0 684 100 ..

Operation in vehicle:

Turn thumbwheel (see upper illustration) to position "0" (basic setting).

Headlight aiming device setting:

Set to cutoff

Test specification (reading):

Cutoff lies at 10 cm inclination.  
(Read off of adjustment scale of headlight aiming device)

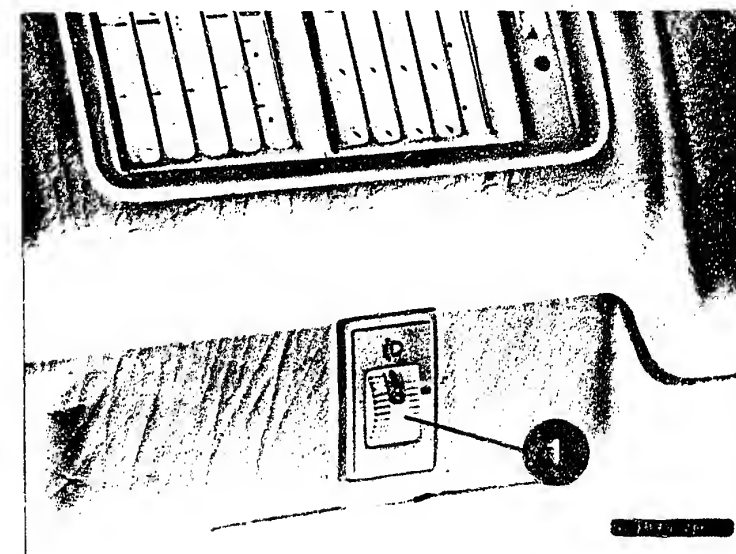
Is cutoff at 10 cm inclination?

no

Set headlight aiming device to 10 cm inclination.  
Repeat basic adjustment of headlights.

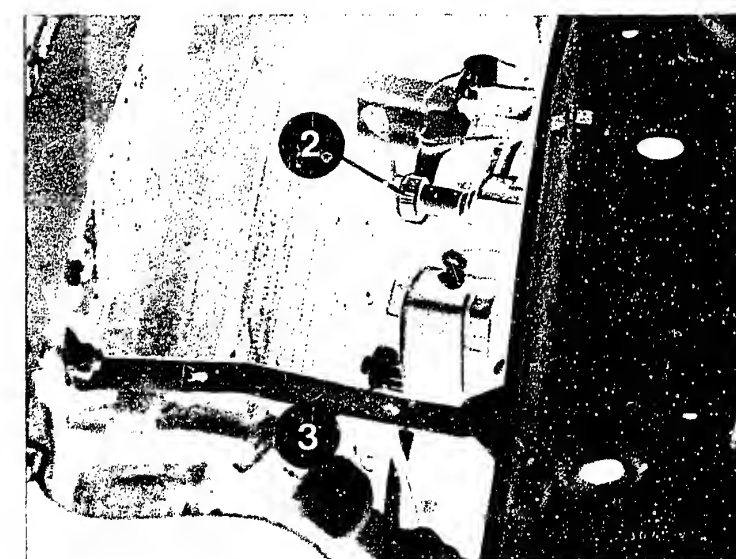
yes

Testing completed



1 = Headlight vertical aim control with thumbwheel

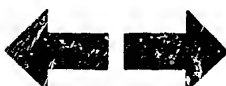
2,3 = Adjusting screw for basic setting



**B22**

Testing and repair

Audi, headlight vertical aim control



**B23**

Testing and repair

Audi, headlight vertical aim control



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